

Leaf collar method

What can the corn plant tell the farmer?

Materials

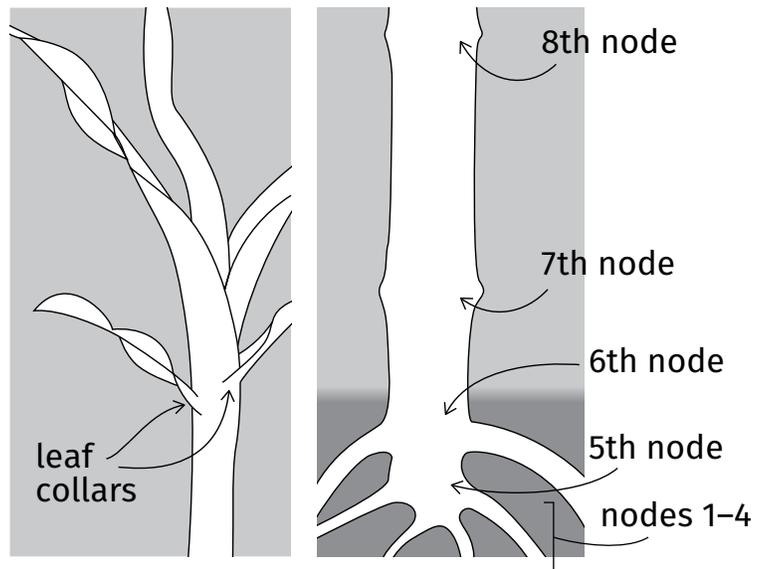
- Knife
- Cutting board
- Corn plant

Background

Vegetative (V) stages are determined by the total number of leaves with visible collars (e.g., a plant with 3 visible leaf collars is at V3). A collar is the offwhite band at the base of the leaf blade where it extends away from the stalk. A new leaf appears every 3 to 4 days with good growing conditions until tasseling.

As the plant grows, lower leaves are lost. These leaves must be counted; otherwise, the development stage will be misidentified.

Split stalks to accurately determine the leaf stage. Each leaf is attached to a single node, and nodes are visible as lines across the split stalk. The first 4 nodes are usually indistinguishable within the crown. The 5th node is about 1/2 inch above the area that contains the first nodes. The node corresponding with the uppermost leaf with a visible collar defines the vegetative stage. This knowledge is important because it helps the farmer determine any inputs that might be necessary to add to his crop as well as the crop's potential yield. Corn needs little fertilizer boost until V5, but requires a large nitrogen intake to promote yield from V8 until VT (tasseling). It is important to sidedress (inject between corn rows) nitrogen before the V8 stage. This allows the plant to maximize its photosynthetic potential. Ear length is determined between the V12 and VT vegetative stages. Tassel emergence occurs from V17 to V22 depending upon the corn variety.



Instructions

1. Use a knife and cutting board to carefully split the stalk of a corn plant in half down to the roots.
2. Remembering that the first 4 nodes are often indistinguishable within the crown, count the number of nodes to determine the vegetative stage that the corn plant is in.
3. Compare the nodes counted within the stalk to the number of leaf collars found on the outside of the plant.

Reflection

1. Why is it necessary to split the stalk to accurately determine the vegetative stage that the corn plant is in? How do the internal nodes compare to the external leaf collars found in/on the plant?
2. How can determining the vegetative stage of the corn plant help the farmer determine when to input fertilizers and predict the ear length?